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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/826,038	04/05/2001	Toshiaki Ohmori	50090-288	3783

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EXAMINER

CHEN, KIN CHAN

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 02/20/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/826,038

Applicant(s)

OHMORI, TOSHIAKI

Examiner

Kin-Chan Chen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 January 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 11-19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election of group I, claims 1-10 in Paper No. 5 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 112

3. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 recites the limitation "the elapsed time". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-3 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Yokoyama et al (US 5,858,863; hereinafter "Yokoyama").

Yokoyama teaches a method of manufacturing a semiconductor device including a plurality of processing processes, the method comprising: a first step of acquiring a measurement value pertaining to a wafer to be subjected to a predetermined processing process. A second step of determining processing requirements for the predetermined processing process on the basis of the measurement value. A third step of performing the predetermined processing process in accordance with the processing requirements determined in the second step. The predetermined processing is etching of a predetermined film and the predetermined measurement valued is a value expressing a physical quantity of the film (such as thickness / dimension of the film). See col. 54, lines 46-51.

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

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6. Claims 1-3 and 6 are rejected under 35 U.S.C. 102(e) as being anticipated by Campbell et al (US 6,284,622; hereinafter "Campbell").

Campbell teaches a method of manufacturing a semiconductor device including a plurality of processing processes, the method comprising: a first step of acquiring a measurement value pertaining to a wafer to be subjected to a predetermined processing process. A second step of determining processing requirements for the predetermined processing process on the basis of the measurement value. A third step of performing the predetermined processing process in accordance with the processing requirements determined in the second step. The predetermined processing is etching of a predetermined film and the predetermined measurement value is a value expressing a physical quantity of the film (such as thickness/ dimension of the film). See col. 5 and 6; Fig. 1 and 7.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Snyder (US 5,863,828) in view of Ogawa et al. (US 5,384,276; hereinafter "Ogawa") or Seo et al. (US 6,376,303; hereinafter "Seo").

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Snyder teaches a method of manufacturing a semiconductor device including a plurality of processing processes, the method comprising: a first step of acquiring a measurement value pertaining to a wafer to be subjected to a predetermined processing process. A second step of determining processing requirements for the predetermined processing process on the basis of the measurement value. A third step of performing the predetermined processing process in accordance with the processing requirements determined in the second step (col. 4 and 6, lines 43-67; col. 7, lines 1-15).

Unlike the claimed invention, Snyder does not teach the measurement value may be the concentration of impurities contained in the silicon oxide film. However, it is known that different concentrations of impurities result in different etching rates. In a method of semiconductor device fabrication, Ogawa (col. 7, lines 56-59) or Seo (abstract) teaches different concentrations of impurities result in different etching rates. Because it is a known feature and because it is disclosed in the prior art, hence, it would have been obvious to one with ordinary skill in the art to modify Snyder by measuring the concentrations of impurities representing the etching rate as disclosed by Ogawa or Seo in order to provide their art recognized advantages and produce an expected result.

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Snyder (US 5,863,828) in view of Delfino (US 4,443,493).

Snyder teaches a method of manufacturing a semiconductor device including a plurality of processing processes, the method comprising: a first step of acquiring a measurement value pertaining to a wafer to be subjected to a predetermined processing

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process. A second step of determining processing requirements for the predetermined processing process on the basis of the measurement value. A third step of performing the predetermined processing process in accordance with the processing requirements determined in the second step (col. 4 and 6, lines 43-67; col. 7, lines 1-15).

Unlike the claimed invention, Snyder does not teach the measurement value may be the refractive index. However, it is known that different refractive index results in different etching rates. In a method of semiconductor device fabrication, Delfino (col. 10, lines 40-42) teaches different refractive index results in different etching rates. Because ^{as disclosed in the prior art} it is a known feature and because it is disclosed in the prior art, hence, it would have been obvious to one with ordinary skill in the art to modify Snyder by measuring the refractive index representing the etching rate as disclosed by Delfino in order to provide their art recognized advantages and produce an expected result.

9. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Campbell et al (US 6,284,622; hereinafter "Campbell") or Yokoyama et al (US 5,858,863; hereinafter "Yokoyama").

As to dependent claims 7 and 8, because Campbell (col. 3, lines 62 through col. 4, lines 10) or Yokoyama (col. 52, lines 38 through 60) teaches using computer to manipulate measured data and perform data processing in the semiconductor device fabrication process, hence, it would have been obvious to one with ordinary skill in the art to perform the various measured data manipulation in order to efficiently communicate measured data to the process.

10. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Snyder (US 5,863,828) in view of Couteau et al. (US 6,352,867 ; hereinafter "Couteau").

Snyder teaches a method of manufacturing a semiconductor device including a plurality of processing processes, the method comprising: a first step of acquiring a measurement value (e.g., a physical quantity of the film) pertaining to a wafer to be subjected to a predetermined processing process (e.g., wet etching). A second step of determining processing requirements for the predetermined processing process on the basis of the measurement value. A third step of performing the predetermined processing process in accordance with the processing requirements determined in the second step (col. 4 and 6, lines 43-67; col. 7, lines 1-15).

Unlike the claimed invention, Snyder does not teach that counting a time which has elapsed since replacement of a chemical to be used for the wet etching and wet etching processing requirements are determined on the basis of the elapsed time. In a method of controlling feature dimensions based on etch chemistry, Couteau (col. 4, line 58 to col. 5, line 26) teaches counting a time which has elapsed since replacement of a chemical to be used for the wet etching and wet etching processing requirements are determined on the basis of the elapsed time. Hence, it would have been obvious to one with ordinary skill in the art to modify Snyder by counting a time which has elapsed since replacement of a chemical to be used for the wet etching and wet etching processing requirements are determined on the basis of the elapsed time as taught by Couteau in order to control feature dimensions during etching processes.

11. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Couteau et al. (US 6,352,867; hereinafter "Couteau").

Couteau teaches determine etching time by using algorithm based on the determined etch rate of the bath and size of the feature. The components in the wet etch bath need to be replenished on a periodic basis (e.g., every a few hours) because it tends to affect the concentration of the components of the bath. In turn, it affects the etch rate (col. 4, line 58 to col. 5, line 26). Therefore, it would have been obvious to one with ordinary skill in the art to count a time which has elapsed since replacement of a chemical to be used for the wet etching and wet etching processing requirements are determined on the basis of the elapsed time. The wet etching is performed in accordance with the processing requirements.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kin-Chan Chen whose telephone number is (703) 305-0222. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Utech can be reached on (703) 308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-2934.

K-c c

02-13-2002

K. C. Chen.
Patent Examiner
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